

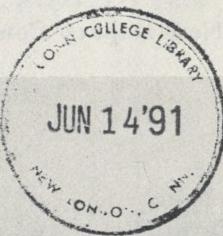
CONNECTICUT



•ENVIRONMENT

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For Those
In Peril
On The Sea . . .

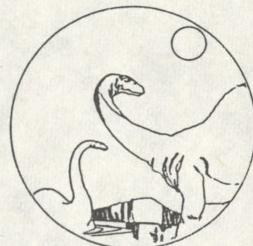


A Few Precautions
Could Prevent Many
Boating Disasters

May 1991

CONNECTICUT
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Editor's Note

WE HAVE ANNOUNCED HERE, LATELY, more than our share of untimely departures. This month, it's the passing of *Connecticut Environment* itself. The June 1991 issue will be the last — at least for the immediate future.

On a positive note, perhaps, *Connecticut Environment* — along with many other D.E.P. and other organizations' and individuals' efforts — has to some degree accomplished what we have intended.

Everyone knows a lot more about the environment, today, than almost anyone knew in 1973. Everyone is a lot more concerned. Including the whole range of the media. Locally, nationally, the environment now gets some admirable, some enviable coverage.

Many of *Connecticut Environment's* contributors and its readers of long standing — those who go back to the early days of the *Citizens' Bulletin* — are the people who have pushed and pulled us all into an era of environmental concern.

Our thanks to them and to all of you.



What's missing from the fun of this race on the Sound?
Notice how few sailors wear personal flotation devices.

Dress for Survival

And other boating safety strategies

Text and photos
by Richard E. Bastian
D.E.P. Boating Safety Division

Safe Boating Week
June 2-8 1991

CONNECTICUT BOATERS are, some would say, an endangered species.

While that could, conceivably, be considered an exaggeration, compared to environmental hazards, the fact remains that 13 people, most of them state residents, died on our waterways last year.

That's more than double the number of people who drowned in boating accidents in 1989. Five people died that year, a number that was quickly matched in the first five months of 1990.

Why were five families in mourning before the end of May? In most cases the reasons have to do with inexperience and lack of information or knowledge of the hazards involved.

The first accident, for example, occurred on the Connecticut River in January when two men set out in an eight-foot boat on the Connecticut River as chunks of ice swirled in the strong current. Neither was wearing a life jacket.

The moment of truth occurred when the pair attempted to change seats. The tiny vessel capsized.

Two people died the following month when their small 13-foot canoe capsized in the choppy waters of Long Island Sound off Westport.

Canoes were the vessels involved for six of the 13 people who drowned in Connecticut waters last year. Statistically 21 canoeists have drowned in Connecticut over the past decade.

An important fact, not to be overlooked, is that nearly all would be alive today if they had been wearing a

Personal Flotation Device or PFD. Equally important and frustrating, if one cares for human life, was the fact that in only five cases were PFDs even carried aboard the canoes that flipped.

The most graphic illustration, perhaps, of how a PFD could have saved a precious human life was the case of a 56-year-old Massachusetts sailboat skipper, last August, who tripped on a line or was hit in the head by a jibing boom — witnesses were not clear on the circumstances — before plunging into the Connecticut River.

Another skipper saw the Bay State man topple into the water but was unable to spot him in the water when she arrived on the scene.

Tragically, the PFD he should have been wearing, but wasn't, would have brought the unconscious man to the surface almost immediately, instead of the natural gases which brought the body into view three days later in Long Island Sound, off the mouth of the Connecticut River.

The 13 boaters who perished last year did not represent the highest death toll. In 1980 there were 18 boating fatalities and three years later, in 1983, the toll was 17 people dead.

What are some of the other causes leading up to boating deaths? Alcohol is a factor in half of the boating fatalities each year. Stir in a little wind, sun, and engine noise along with vibration, and you have a deadly brew.

On cooler fall or early spring weekends the key killer is often hypothermia or subnormal body temperatures

caused by long exposure to cold northerly winds or accidental immersion in frigid water.

A shivering body and chattering teeth while cruising on Long Island Sound are not always recognized as the first signs of hypothermia, a highly dangerous physical condition that can lead to fatigue and ultimately misjudgments and accidents.

The dangers from hypothermia in the water develop more quickly and are more deadly. Cold water saps body heat much faster than cold air.

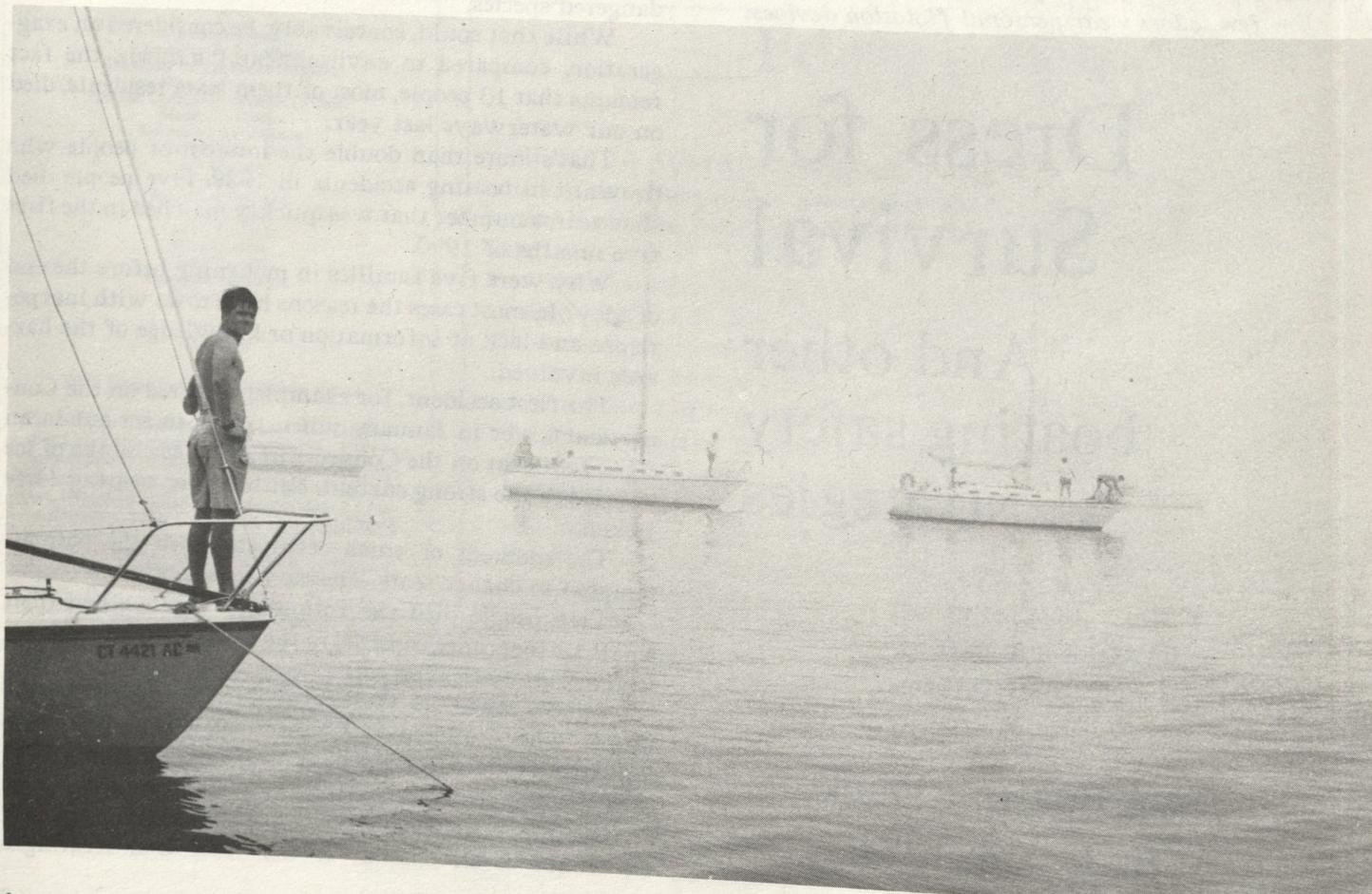
Wearing a hat can curb the escape of body heat dramatically. Climbing out of the water onto the bottom of an overturned boat is the best measure for buying time before rescue.

Staying as still as possible in the water, if unable to climb out, or huddling with one or more persons, is also an important means to retain body heat in the central core area of the body which is critical to staying alive.

Assuming a fetal position — raising the knees as close to the chest as possible — also helps to retain the essential inner body heat.

While it might seem a good idea to move vigorously, to stay warm, such activity is actually self defeating. Vigorous movement only brings blood to the surface where it is rapidly cooled down by the cold water. A body

Before heading out to sea think about dressing for survival. Hypothermia plays a significant part in many spring or fall boating fatalities.





Almost half the drownings in Connecticut last year were canoeists. Wearing a PFD is vital for every boater. And before you embark, take a basic boating safety course!

actually cools 35 percent faster swimming or even tread-
ing water.

Cold water and cooling of the blood will trigger the body's automatic protection system that will cut off the flow of blood to the extremities to conserve and preserve body core warmth.

The lack of blood flowing into the arms and legs will result in a numbing and loss of physical dexterity. Put more simply, the unlucky individual in the cold water quickly loses his ability to help himself.

That fact, combined with the loss of consciousness when the body core temperature drops below 90 degrees, roughly speaking, and depending on individual body mass, leads quickly, if there is no other help readily available, to the bottom line — death.

Thin people lose their body heat faster and succumb to the effects of hypothermia more quickly than individuals with more body fat. Children in the water should be kept inside a circle of adults in the water.

A person of "average" body size may survive as long as two and one-half to three hours in 50-degree water — Long Island Sound temperatures don't exceed that level until well into June — if he or she remains relatively still in the water.

Survival time is reduced significantly as the water temperature goes down. For example, an individual will

probably lose consciousness in 30 minutes in 40-degree water temperature and in half that time at a water temperature slightly above freezing.

Looking forward to the forthcoming boating season, there is really little to fear if proper and prudent precautions are observed.

Venturing out on the water in the chilly or wintry months of the year, whether on Long Island Sound, the Housatonic River or Candlewood Lake, demands proper clothing. A wet suit or dry suit both offer a maximum degree of protection. Wool clothing is preferred for its heat retaining quality when wet.

If you are a neophyte boater, or even as a refresher for the veteran sailor, enrolling in a basic boating course sponsored by the Boating Safety Division of Connecticut's Department of Environmental Protection is an excellent first step toward ensuring a safe summer on the water.

It's not just a cliche to "know before you go."

LISTS OF BOATING SAFETY COURSES offered in Connecticut are available from the Boating Safety Division, P.O.Box 280, 333 Ferry Road, Old Lyme, CT 06371-0280; 434-8638. You can also get a state by state listing from the U.S. Boat Foundation by calling 1-800-336-BOAT.



About the whippoorwill, whose charming Latin name is *Antrostomus vociferus* vociferus, Rex Brasher wrote:

A country victim of insomnia need not bother tabbing sheep — try counting how many times the WHIPPOORWILL calls. After several hundred he probably will be asleep; if not, keep on — the bird never tires (that is, if it happens to annoy the listener!)

The notes are resonant, and can be heard half a mile or more. They are probably the most widely known of nocturnal cries. A low cluck precedes and a jews-harp finale follows the main theme but can be heard only when the audience is close by.

I like to hear the calls coming down our valley in the Spring and my rest is not disturbed by them, but then I have been known to go to sleep when Neptune was using a sledge on the schooner's bows, so perhaps I am not an unbiased judge. Moreover, the rest of the crew hates them so I had better end this biography here.



Rainforest's
not all we need
to keep our
songbirds
vociferous

Support
Clamor

by Lisa Garafola

IN THE SPRING, THEIR NOTES herald the season with an enthusiasm matched only by a child's glee on the first warm day. In the summer, these harbingers of spring serenade us while we barbecue, picnic and play. Early in the fall, many of them depart ... for "down south," we assume.

Lately, however, it seems that someone has turned down the volume — some songbirds seem quieter, a little less noticeable. To an extent, we control the volume, and we are silencing our songbirds. Man's assaults on the environment, from here to the tropical rainforest, are seriously affecting some songbirds.

At first, the rainforest connection seems a bit sketchy. Yes, rainforest destruction threatens biodiversity, but how does that affect "our" songbirds? Actually, our songbirds do not belong to us. Many of our familiar songbirds visit Connecticut for four months, using this area as a literal love nest: they travel to Connecticut each spring to breed. In spring and fall "our" songbirds' time is spent traveling to and from the south — to Florida or to Texas or, for some species, to points south as far away as the tropical rainforest. And radar studies show that the number of birds migrating from North America to the rainforest has been halved in the last 50 or 60 years.

Unfortunately, parts of the tropical rainforest, once a winter haven, no longer welcome songbirds. The following scenario has become all too common. Songbirds fly thousand of miles, sometimes in a single stint, to their winter home. They find that what was once mighty and lush is now harsh and dry ... and no longer a suitable habitat. Songbirds can not survive without the protective umbrella of the forest. Some are unable to locate food, so they starve. Fragmented rainforests force forest interior species to use forest edges which they do not normally use and to compete with South American resident bird species for suitable habitat. Competition means overall stress is greater.

Of course, we cannot simply point our fingers at our southern neighbors. The northern hemisphere must shoulder a fair share of the blame. Like Central and South American nations, North America has altered and destroyed songbirds' habitat, both in Connecticut and in other areas where some of our birds winter, to suit man's needs.

Songbirds grace us with their songs as a part of their mating rituals. But a love song is not sufficient foundation for a love nest. Some songbirds require extensive woodlands in order to breed. But many of these woodlands are being cut down so we can build housing developments and shopping malls. For birds for whom "edge" habitat is not an ideal home, survival becomes a sometimes

overwhelming struggle. In such cases, from the songbird's point of view, the picture in Connecticut is not very different from the picture in the tropics.

Jay Kaplan, director of Roaring Brook Nature Center in Canton, claims that the story of the whippoorwill could become the story of many of our feathered friends in Connecticut. Once upon a time, the whippoorwill, distinguished by its onomatopoeic song, thrived in the state. Lately, however, scientists, birdwatchers, and others have noticed a decline in the whippoorwill population in Connecticut. The whippoorwill is included, as a species of special concern, on the current list of threatened and endangered species proposed to the state legislature. Where, we ask ourselves, did the plot change? Some blame our southern neighbors. According to this theory, those who cut down the tropical rainforest are home wreckers because whippoorwills migrate to the tropics and spend the winter there. This camp reasons that the simultaneous destruction of the rainforest and the dwindling whippoorwill population must be linked together. Other critics claim that we are the culprits. Chemical sprays used during our repeated gypsy moth infestations killed large flying insects, the mainstay of the whippoorwill's diet.

The truth is that both camps are correct. Rain forest destruction impacts wintering bird populations. Local activities affect breeding populations in Connecticut. What we do know is that other birds are facing the same fate as the whippoorwill.

In the end, songbirds probably won't become extinct. The more plausible possibility is that some species will become rare and the songs we hear less diverse.

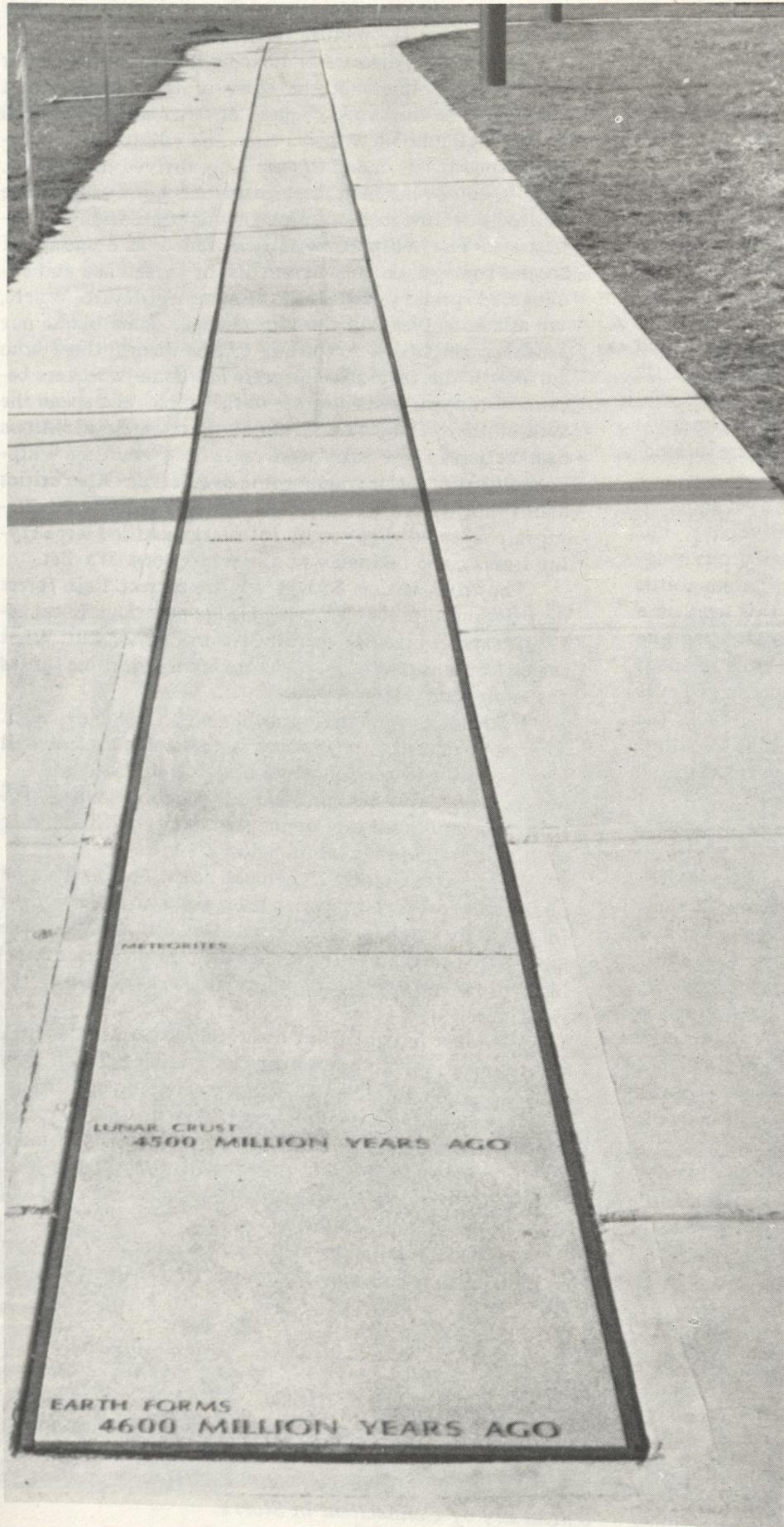
We can, however, provide our songbirds with a future different from that of the whippoorwill. To do this, we must make protection a priority.

We must recognize the global links. The destruction of the rainforest impacts our lives and our environment in more ways than we realize. The link between the destruction of the rainforest and the plight of some songbirds gives us just one of many reasons for saving the rainforest.

We must recognize our own role. We cannot assume that our actions do not affect our songbirds. Each new housing development and each new shopping mall translates into a smaller welcome mat for some of our feathered friends. Chemicals that we put into the environment affect not only the birds themselves directly but also, indirectly, by way of effects on their food supplies and water sources and habitat.

Songbirds are not doomed. But we must play our part to keep their whole range of music in our lives. □

The whippoorwill, facing page, by Rex Brasher, is among the 874 Brasher bird paintings now in the collections of the Connecticut Museum of Natural History at the University of Connecticut in Storrs.



A Walk on Time

At Dinosaur Park, Education Begins At The Entrance

Text, photographs, graphic by
Mark R. Kibby
UConn Writing Intern

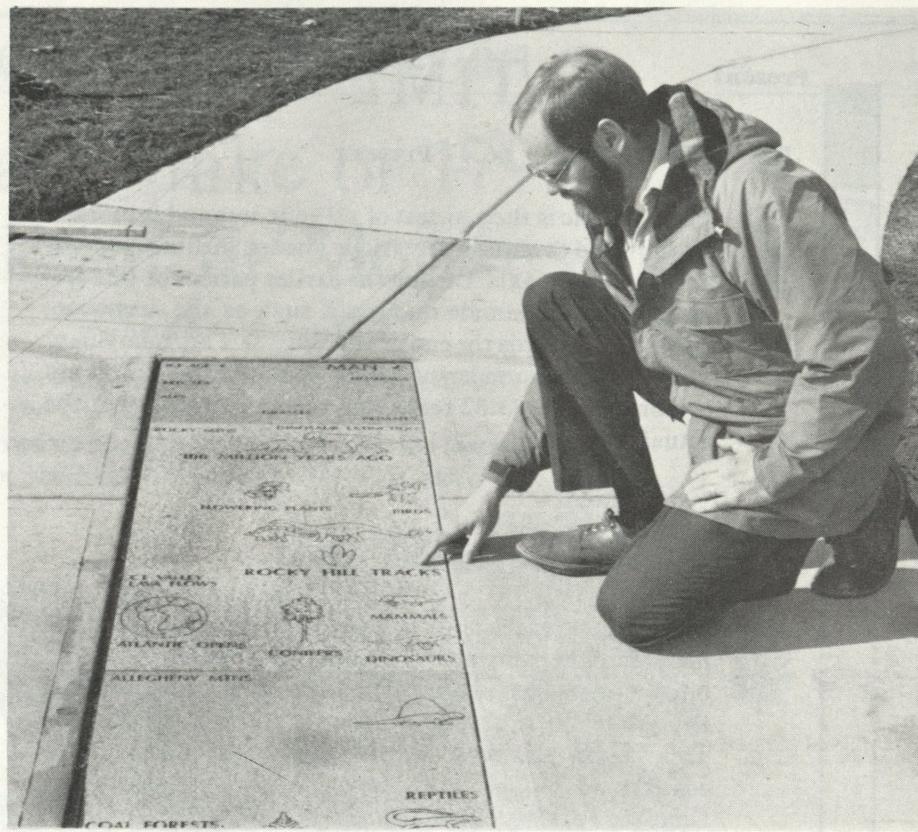
HAVE YOU EVER TRIED to imagine how long ago it was that your grandparents or your great grandparents were young children? Perhaps with a family tree it is not too difficult. But have you ever tried to imagine how long ago it was that the earth formed? If I throw a number at you like 4600 million years (M.Y.), would that be of any help? Trying to grasp time on such an enormous scale as that is really impossible unless you can somehow visualize it. And it is just this kind of visualization that Dinosaur State Park now offers.

In December of 1990, after years of planning, Dinosaur State Park built an outdoor Timeline ... a very long Timeline. The construction of the timeline was part of the recent construction of a new parking lot and sidewalk. In fact, the Timeline was planned so that the public could actually walk "on time" because it was built into the sidewalk between the parking lot and the entrance to the geodesic dome.

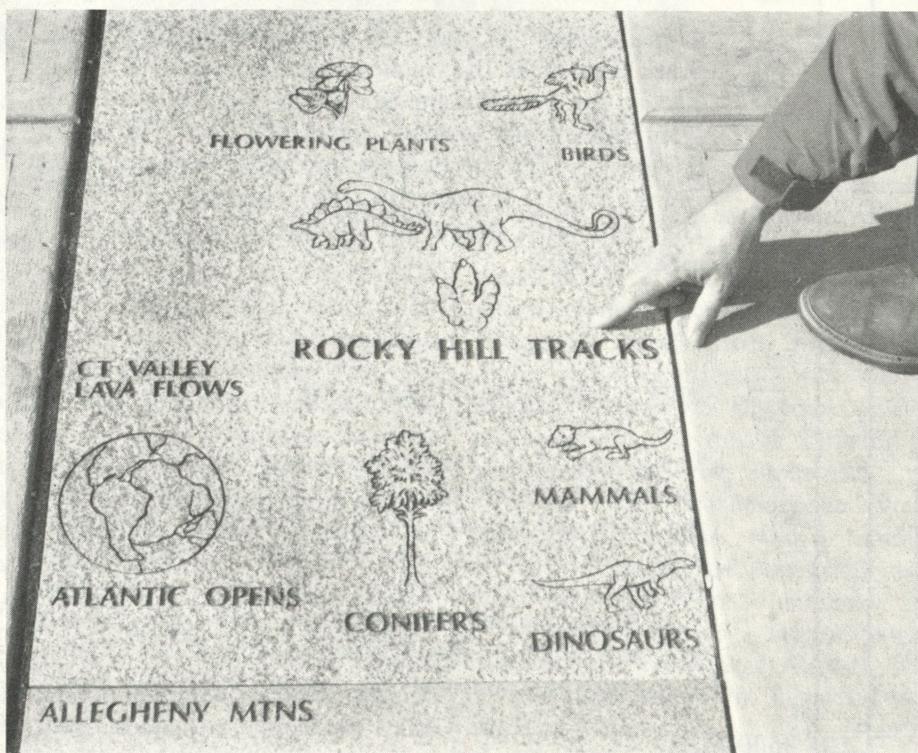
The Timeline's dimensions are 92 feet in length by two feet wide. The 92 feet represent 4.6 billion years, or 4600 M.Y., of earth's history. The Timeline further represents earth's history by making distinctions among its four major eras, using different colored granite. The four primary units of history are as follows: Precambrian, Paleozoic, Mesozoic, and finally, Cenozoic.

Making a Timeline of this size is by no means an easy task. Richard Krueger, geologist and Environmental Education Coordinator at Dinosaur Park, was the one responsible for planning and developing the park's latest addition. But he is quick to point out that the actual construction was done by a Massachusetts-based granite company, headed by Kenneth Granny. Granny's first step in preparing the granite was to cut 44 individual plates. These plates are roughly two feet square and are two inches thick. The plates were then stenciled and sandblasted to create the graphic imagery which is present along the length of the timeline.

Stenciling allows the craftsman to lay out the lettering or design on the plates. Images of particular animal



Richard Krueger, geologist and environmental education coordinator at Dinosaur State Park, points out the Rocky Hill tracks on the Timeline. Behind him, above, man's 12,000 year history is represented by the crack at the end of the Timeline. Built into a 92-foot stretch of new sidewalk from the parking lot to the Exhibit Center (facing page), the Timeline consists of 44 granite plates stenciled with representations of geological developments and evolving plants and animals (below).



Present

TIME

CENOZOIC: 66.4 - Present



The Cenozoic is the shortest of all four eras and is marked by the rapid evolution of various grasses, shrubs and higher flowering plants. During the earlier periods of this era, many large mammals disappear, such as the mastodon. However, towards the end of this era, there are many new varieties of mammals; including, of course, man. This era is represented by 1.32 feet along the 92 foot length of the actual timeline.

MESOZOIC: 245 - 66.4



The Mesozoic era is marked by the development of mammals and the continuous growth of reptiles, fish, and birds. The earliest period of this era, otherwise known as the Triassic period, saw an abundance of dinosaur life. This period also saw the widespread development of conifers, many species of which have been planted on Dinosaur Park's grounds. The end of this era, or the Cretaceous Period, was witness to the extinction of the aforementioned dinosaurs. The total of the Mesozoic's 179 m.y. are represented along 3.58 feet of the park's Timeline.

PALEOZOIC: 570 - 245



A great variety of plant life originated during this era. Other than plant life, there is incredible growth taking place in the waters of the Earth. The rise of land animals — amphibians and insects — also takes place. The end of this great era saw the disappearance of earlier amphibians and the growth of primitive reptiles and modern insects. This era covers a total of 325 m.y. and is 6.5 feet along the park's Timeline.

PRECAMBRIAN: 4600 - 570

The longest of the four eras and yet the least known to scientists. This era's beginning is marked by the cooling of the Earth and the solidification of its crust. The oldest earth rocks known to exist date back to 3800 m.y. ago. Fossils do exist from this, although they are very rare. Such fossils include forms of algae and simple animals. The total length of time of this period alone is 4030 m.y. and can be seen covering 80.6 feet of the 92 foot total.

4600 M.Y.

forms, dates, and geologic changes are among the stenciled information. Once these are laid out on the granite, it is then sandblasted. While leaving the rest of the granite protected, the craftsman shoots a high velocity stream of sand at the stencil to engrave the granite.

WHEN I VISITED THE PARK in late January, I was given a warm welcome and a personal tour of the Timeline by Krueger. Taking the walk with me, he pointed out the dramatic changes that the earth has undergone. What was most astonishing to me, however, was the very end of the Timeline itself, the point at which I reached mankind. It is on the very end of the 44th plate that an arrow the size of a child's hand points to a crack which divides the last plate from the concrete sidewalk. When I asked Krueger what the arrow indicates, he gave a chuckle, and said, "This arrow pointing at the crack signifies the last 12,000 years ... man's stay here on Earth and what we know as civilization."

A revelation struck me when I was told that a thin crack along a 92 foot stretch represents mankind's brief stay on the planet. It is overwhelming to think of the damage and destruction man has caused upon this ancient planet. I asked Krueger if the impact which I felt was what he wanted all visitors to feel. His response was simply put: "No, our objective was to make visitors aware of the vastness of the Earth's history. Geologic time is a very difficult concept to understand. The Earth's history as portrayed on this line gives visitors something tangible to look at."

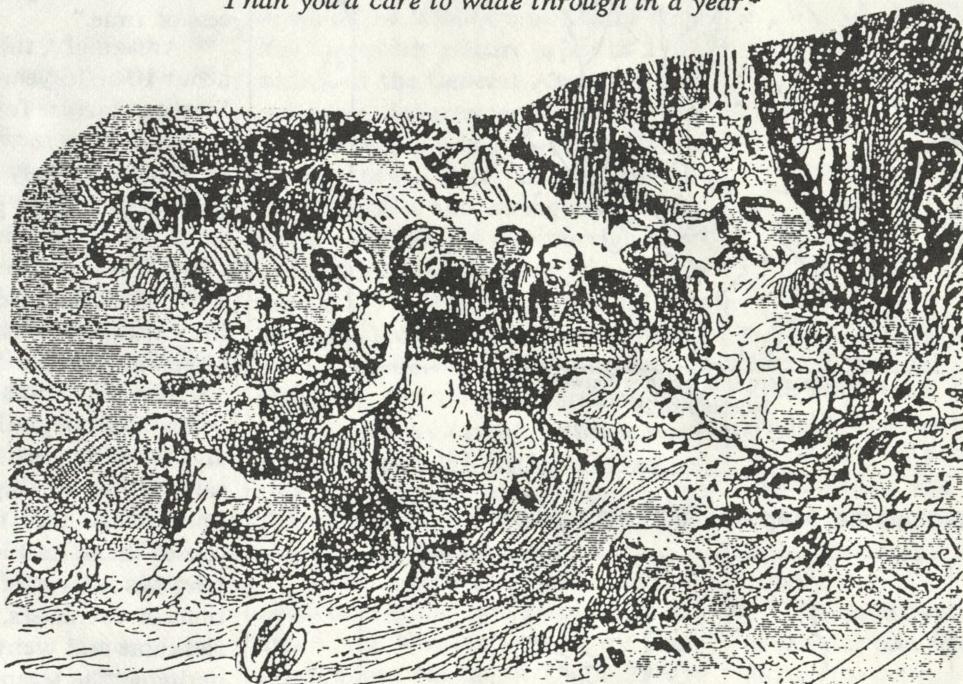
DINOSAUR STATE PARK has something to offer almost everyone. For those of you who have not yet been to the park, besides this new addition there are also a variety of displays inside the geodesic dome, including the paleontological treasure of over 500 dinosaur tracks. The park is open Tuesday through Sunday, 9 a.m. to 4:30 p.m. Admission to the Exhibit Center is \$2 for adults, \$1 for young people 6 to 17.

The Natural Historian

Great Quake of 1791: Shakeup in Moodus

by Alison C. Guinness

*It isn't a groan, nor a crash, nor a roar,
But is quite blood-curdling to hear,
And has stirred up more theories crammed with learned lore
Than you'd care to wade through in a year.**



TWO HUNDRED YEARS AGO this month, in the quiet, tiny settlement of Moodus, Connecticut, nestled among the hills between the Connecticut and Salmon rivers, the earth shook. According to Rev. Henry Chapman, "It began at eight o'clock, P.M. with two very heavy shocks in quick succession ... stone walls were shaken down, chimnies were untopped, doors which were latched were thrown open, and a fissure in the ground of several rods extent was afterwards found." Several other shocks followed into the next day. The ground shook all over New England, from New York to Boston.

This was the Great Moodus Quake of May 1791.

Earthquakes were known and experienced in New England and Connecticut during early settlement. Governor John Winthrop wrote of them as early as 1639, and the Indians who lived in the area had told of them from one generation to another for centuries. The Wangunk Indians, who resided in the Moodus area, believed that the quakes were caused by their evil god Hobomoko. Hobomoko lived in a cave below Mount Tom with two sets of witches, the good, white witches and the evil, black witches. Naturally, the witches didn't get along, and they fought constantly. When Hobomoko had endured their bickering long enough, he would wave his glowing pearl-tipped wand and create

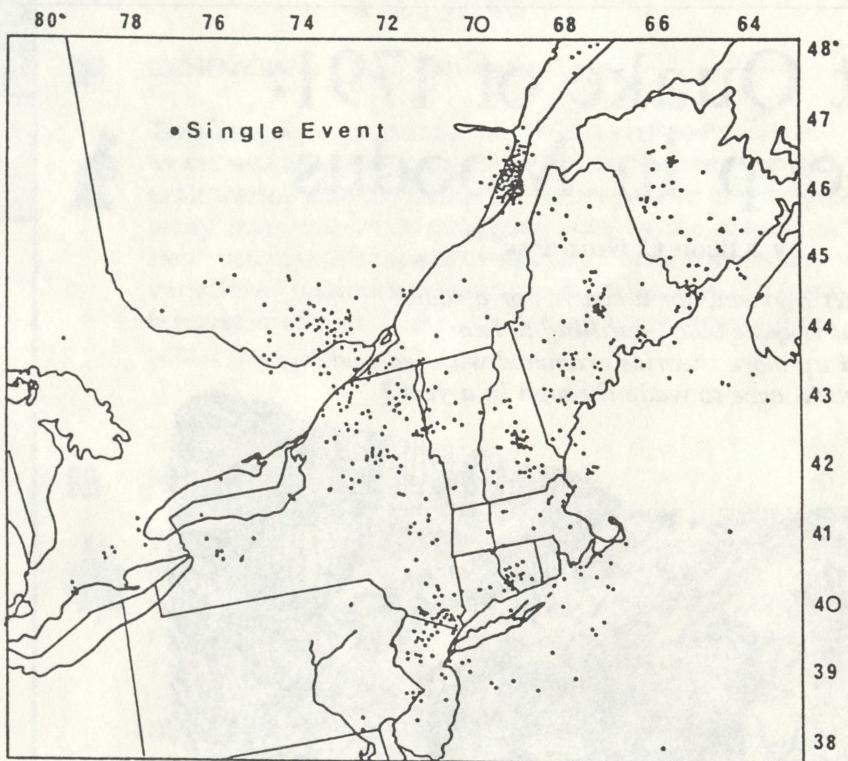
a great wind that would blow the witches out of the cave, violently shaking the ground and causing the air to tremble with the sound of thunder. The Indians called Hobomoko's abode Machemoodus, "place of noises." Knowing the wrath of his anger, the Wangunks performed rituals or "pow-wows, sacrifices, and ceremonies" to appease Hobomoko. The early settlers saw this as "driving a prodigious trade with the devil."

Over time "Machemoodus" was shortened to Moodus, but the noises lived on, and the settlers fashioned their own stories about the noises.

One tale tells of a Doctor Steel, who arrived from Great Britain between 1755 and 1770. Regarded by some as a savant and by others as a transient, he was probably a response

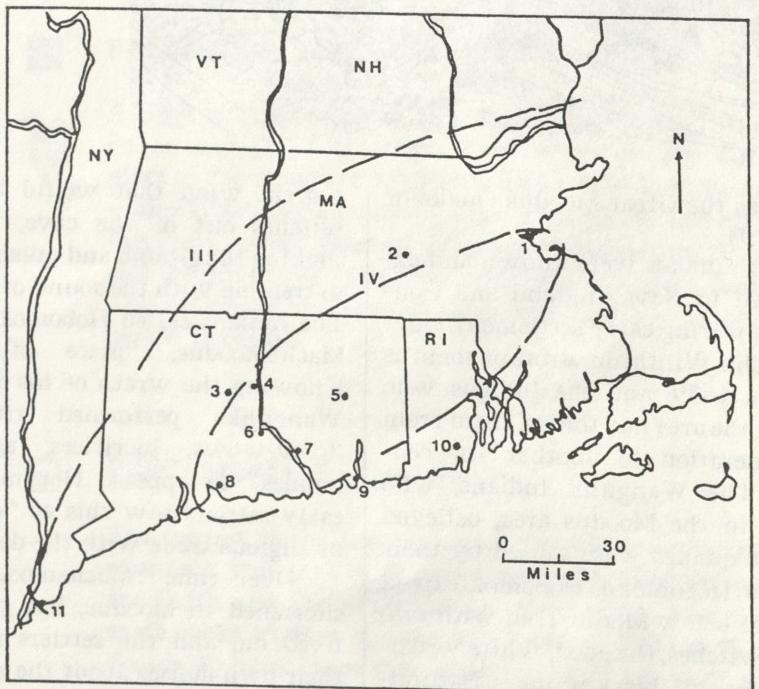
*from "Moodus Noises: A Rhyme for the Fourth of July (1884)" by Reginald Sperry

Earthquake Epicenters



Northeastern U.S. Seismic Network
Bulletin No. 29
October 1975 - December 1982

Isoseismal Map of 1791 Earthquake*



- | | |
|-----------------------|------------------------|
| 1 Boston — IV | 7 East Haddam — VI-VII |
| 2 Worcester — III | 8 New Haven — IV |
| 3 Farmington — III | 9 New London — III |
| 4 Hartford — IV | 10 Kingston — III |
| 5 Windham — IV-V | 11 New York |
| 6 Middletown — III-IV | |
- *NRC Millstone Impact Statement

to the earthquakes in London during the 1750s. The colonists said he came to Moodus for the sole purpose of finding the cause of the infamous noises. He was very mysterious and worked only at night exploring the landscape and toiling away in his workshop, where he stuffed all the cracks and covered the windows to maintain the secrecy of his work. Eventually, he claimed to have dug up two glowing pearls he called "carbuncles," and by removing them, he had stopped the noise, "but as he had discovered others in miniature, they would be again heard, in the process of time."

Amazingly, this was true, and for about 10 or 15 years following Doctor Steel's departure for England with the carbuncles, there were very few noises. However, they started again. The Indians said their god was angry because the Englishman's god had come there. Perhaps, the Great Quake of 1791 was Hobomoko's expression of his displeasure with Doctor Steel's interference with the noises.

The earthquakes and noises still persist. Although Governor Winthrop and the early settlers identified them correctly as earthquakes, they didn't understand the mechanism which caused them. As science prevailed over religious and less enlightened explanations of the noises, a number of theories came and went. Some are as fascinating as the legends.

In 1836, John W. Barber claimed, in his book, *Connecticut Historical Collections*, that "the cause of the noises is explained by some to be mineral or chemical combinations, exploding at a depth of many thousands of feet beneath the surface of the earth." This "old story of fermenting and decomposing pyrites" was rejected in 1840 by the renowned Professor Benjamin Silliman of Yale as "inadequate to account for movements extending at intervals through centuries." In 1841, professors at Wesleyan in Middletown agreed with Silliman that the phenomena of "decomposition or combustion of some mineral substances," as happens in coal mines and iron pyrites, "always manifest themselves so differently from any substances connected with the Moodus noises." At this time, scientists knew more about what

the noises weren't than what they were.

Toward the end of the 19th century, Hosford Niles proposed in *The Old Chimney Stacks of East Haddam* "that there is a subterranean passage leading from a large cave near Mount Tom to the sea, and that the noises are produced by certain delicate combinations of wind and tide." This theory was disproved in the 1960s by a local science teacher who searched the countryside for caves and found only the one the Indians used in their rituals, and that cave is inland and not connected to water.

Today, scientists attribute the Moodus noises to seismicity, shallow earthquakes which occur one-half mile or less below the earth's surface. These earthquakes are often so small that they are not felt, but the high frequency vibrations they cause couple with the atmosphere to create a noise something like thunder. At times, the sound is a like booming thunder, at other times, like rolling thunder. Over the centuries, it has been described as the rattling of coaches, pistol, musket, or cannon fire, a heavy log falling, a furnace exploding, a heavy truck passing, bowling, or a sonic boom. These descriptions are an interesting reflection of historical and cultural evolution.

Scientific study of Moodus area seismicity is intense, due primarily to the presence of the Connecticut Yankee Nuclear Power Plant in Haddam Neck, adjacent to the Moodus seismic area. Before Northeast Utilities was given permission to locate the facility in Haddam Neck, the site was extensively studied for its environmental and geological risks. This included close examination of the historical record of seismic activity.

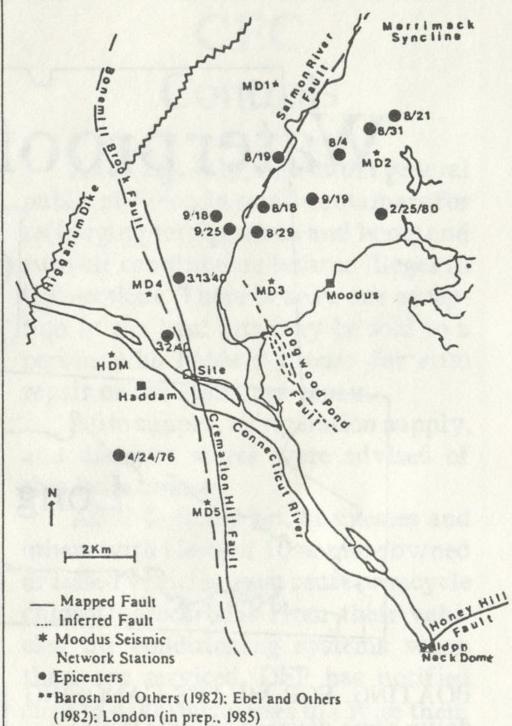
The largest earthquake on record for the Moodus area was the May 1791 earthquake. The description of chimneys falling and fissures in the ground at first led scientists to rate this earthquake as an Intensity VIII. Intensity ratings were based on the amount of damage to manmade structures. The collapse of chimneys and stone walls was considered heavy damage. However, back in the 1700s construction techniques were not what they are to-

day. Some chimneys were poorly constructed with inferior mortar. It probably wouldn't have taken much to collapse them. There were no reports of entire buildings being destroyed, and the Wesleyan professors mentioned earlier couldn't find any evidence of the fissures 40 years later. A quake as powerful as Intensity VIII would certainly have left traces for many years.

Neither was reference made to the quake in any of the sermons preached at that time. Earthquakes were popular subjects. The earliest written evidence of the Moodus noises came from Rev. Jeremiah Hobart who, in 1702, addressed the General Assembly concerning a disagreement between him and the people of East Haddam. He said that he hoped that "the strange belching noises and earthquakes lately heard may awaken them to righteousness." Surely a quake as large as the one in 1791, which was felt all over New England, would have provided sermon material for a number of preachers, but no such sermons have been found. As a result of the investigation of the 1791 earthquake and the lack of evidence found to support its strength, the Great Quake was downgraded to an Intensity VI.

Since the construction of the Connecticut Yankee power plant in the 1960s, the Nuclear Regulatory Commission and Northeast Utilities have continuously supported studies of the geology of the Moodus area. Bedrock has been mapped, deep holes have been drilled in search of faulting, and a number of seismographs have been placed in and around Moodus to record the earthquakes. The seismographs recorded four swarms of micro-earthquakes during the 1980s. These are groups of hundreds of earthquakes that are very small in magnitude, often in the negative part of the magnitude scale. The detection of negative magnitude earthquakes is possible due to the development of more refined equipment since Charles Richter created his magnitude scale in the 1920s. Magnitude is based on the amount of energy released by an earthquake rather than the amount of damage caused. This is a more accurate indication of the strength of the earthquake

Moodus Geology**



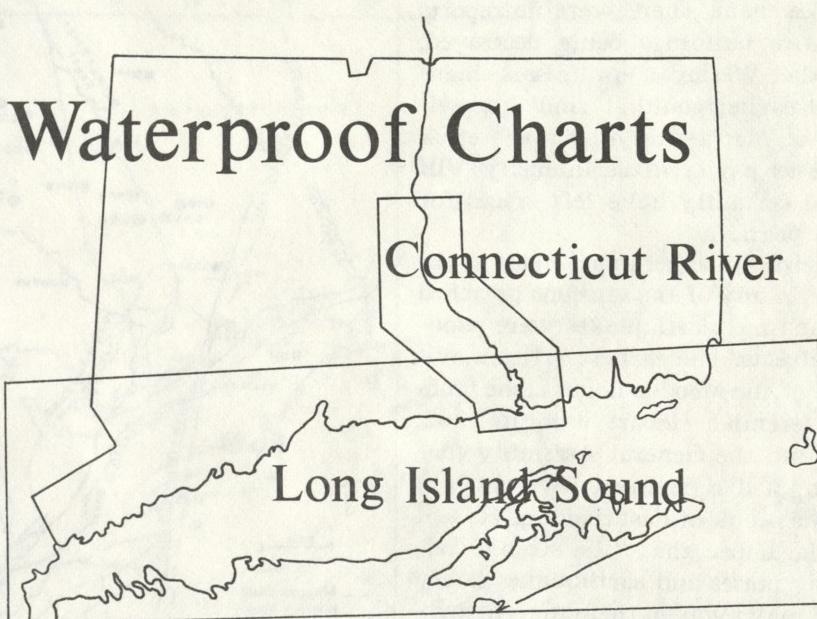
since a number of factors play a role in the collapse of buildings. These include the underlying rock structure, type of construction, size and height of the building, and the way the building reacts to the energy waves created by the earthquake.

The latest swarm of earthquakes in Moodus occurred in 1987 and 1988 during the drilling of a mile-deep hole to investigate the noises. A great deal of data was collected at that time, and scientists may be closing in on the elusive noises, but, to date, no one has determined the exact location of the fault that is causing this latest burst of seismicity in the Moodus area.

Continuous, gradual release of strain by low magnitude earthquakes probably lessens the likelihood of another Great Quake, but earthquake prediction is still in its infancy, and many variables contribute to damage to manmade structures. Perhaps Hobomoko still needs to be pacified, but even modern science has not learned how to do it any better than the Wangunks of 200 years ago had.

Alison Guinness is an environmental educator and consultant from East Haddam. □

Map of the Month



BOATING. FOR ME IT'S CANOEING down some western or some New England river with my friend Joe. For others, it means 150 horse powered, fiberglass hulled weekends, and for still others driving down to the water's edge and just watching.

Two things that boating enthusiasts need to know are what's around the next bend and what the weather will be. We can help with the first.

As you may know, the National Oceanic and Atmospheric Administration (NOAA) produces maps that show the offshore depths of navigable water bodies. These are called charts.

In Connecticut, Long Island Sound and the Connecticut River are the two major waterways for which boaters need navigational information. Over the last 12 months we have acquired single-sheet waterproof navigational charts for both. These charts serve the needs of both boaters and fishermen for water depth information.

It takes several charts to cover either Long Island Sound or the Connecticut River. This number of sheets can be a nuisance. In addition, since normal charts are printed on paper they are prone to water damage from spills and spray and, in general, suffer from extended use. Now there is an alternative.

The original NOAA chart information has been printed onto single waterproof sheets for both Long Island Sound and for the Connecticut River. The sheets are a special polypropylene plastic that is completely waterproof and tearproof. You can use lead pencil, grease pencil, and most pens to write on them. You can remove the markings and wipe the chart clean with a damp cloth. All of which makes the charts far more versatile than NOAA's originals.

Waterproof Chart of Long Island Sound

THIS SINGLE SHEET is a compilation of the latest NOAA charts available at the time of printing. The sheet measures 46 by 34 inches and is printed on both sides: the eastern Sound on one side and the western on the other. The scale of this multicolored chart is 1:88,000. It covers all of the water and surrounding land area from just west of the Throgs Neck Bridge to just east of Point Judith and includes all of Montauk Point and Block Island.

The chart is filled with reminders of obstructions and wrecks, mooring buoys, shoal areas, and even fish weirs. There are legends and a conversion chart to relieve any confusion about nautical measure.

The coastline on this map is dotted with reference point locations of smokestacks, water towers, and even church spires in coastal communities. For instance, from the shore in Milford you can see over to an industrial area of Port Jefferson on Long Island. And there on the map, just as they should be, are the chimneys or stacks that mark the location. For those who use it, Loran navigational information is also included. The single sheet is \$14.95.

Waterproof Chart of Connecticut River

THIS TWO-SIDED N.O.A.A. navigational chart incorporates five separate panels to provide coverage of the river from Long Island Sound up to Hartford on a single sheet.

Three colors dominate the map. The river, coves, ponds, and some tributaries are in blue. The landscape bordering the river and the major islands are brown. The maintained channel of the river is white. The depth measurements for the river were measured at low tide and are given in feet. Known sand bars, shoal areas, and major islands are named and marked. The locations of many lighthouses, rocks, pilings, and jetties are given. Also, the landscape along the river is represented topographically, showing the grade of the shoreline.

If boating, fishing, or the combination of the two draws you to the Connecticut River, this map will be an asset. The sheet size is 25 by 38 inches, printed on both sides. The scale is 1:25,200 (1 inch ~ 0.4 mile), \$14.95.

THAT LEAVES THE QUESTION of weather. I suppose the radio is as good a source as any. Add to that a schedule of tides and you're just about ready to go. Maybe I'll give Joe a call . . .

TO ORDER, PLEASE include \$2.00 for shipping and handling per order and eight percent Connecticut sales tax. Our address is: DEP-NRC, Map Sales, Room 555, 165 Capitol Avenue, Hartford, CT 06106.

For Your Information

New Pesticide Posting & Notice Requirements

Starting this year, homeowners and commercial applicators must post signs indicating that an area was treated with pesticides if they are applying them to non-agricultural areas closer than 100 yards from neighboring property lines. Homeowners are exempt from this requirement only if the area is less than 100 square feet or fenced.

The signs, which are yellow with black print, must be posted at points of entry onto the property and every 150 feet along road frontage. Homeowners can get the signs from retailers of pesticides.

As a reminder, pesticides include herbicides (weed killers), fungicides, and rodenticides (rat killers) along with insecticides (bug killers).

The requirement for homeowner posting is unique in the nation.

Regulations accepted late last year by the state legislature also provide that persons who have enrolled on a notification registry be given 24-hour advance notice by any pesticide application business when abutting property owners have their property treated by a commercial applicator.

The DEP will maintain this registry and will mail out copies to all commercial pesticide application businesses on an annual basis.

The deadline for persons wishing to be included on the 1991 registry was January 31, 1991. If a person missed this year's deadline for inclusion on the DEP registry, he/she may request notification directly from the company. The company will notify those persons independently of the registry and will forward the names to the DEP for inclusion on the next year's registry.

There is no requirement for a doctor's certificate or any other proof of pesticide sensitivity. The advance notice does not give persons on the registry the right to stop an application; rather it gives them time to avoid exposure by shutting windows, covering gardens or leaving during application.

Application of pesticides to golf courses and to lakes and ponds is covered as well. Golf courses have to post a sign in the clubhouse and on the first and tenth tees indicating that pesticides have been used. Lakes and ponds with public access must also be posted and newspaper notices published.

For further information or forms for inclusion on future registries, contact DEP's Pesticide Management Division (165 Capitol Ave., Hartford, CT 06106; 566-5148). ■

CFC Controls

As of last July, sale to the general public of Freon in small containers for recharging refrigerators and home and auto air conditioners became illegal in Connecticut. There is only one exception to the ban: kits may be sold to a person who holds a license for auto repair or for appliance repair.

Auto supply, refrigeration supply, and discount stores were advised of this last summer.

As of January 1st, businesses and others with fleets of 10 or more owned or leased vehicles must reuse or recycle chlorofluorocarbons from their vehicles' air conditioning systems when these are serviced. DEP has notified close to 4,000 businesses to advise them of this requirement. ■

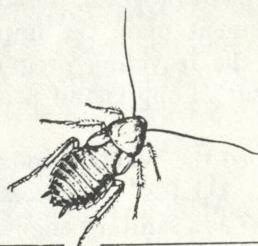
PESTICIDE APPLICATION



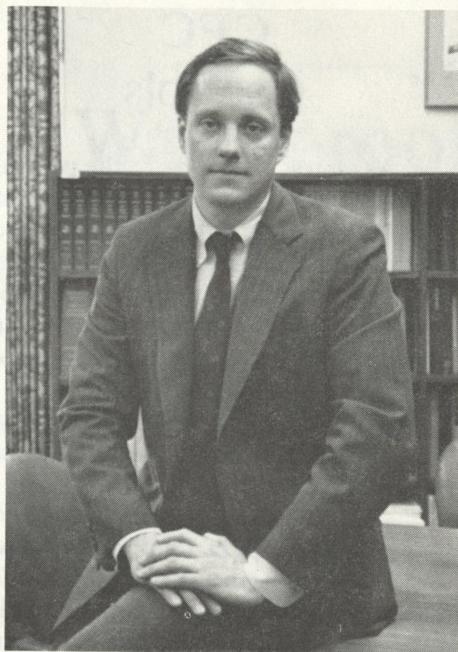
Pesticide
Applied On: _____

By: _____

This sign must remain for 24 hours following
pesticide application



(Photos: Rosemary Gutbrod)



Thomas J. Dudchik, an Ansonia resident who served in the Connecticut General Assembly, has been appointed by Governor Lowell P. Weicker to the post of deputy commissioner of D.E.P.'s Branch of Environmental Conservation.

A Trinity College graduate, Dudchik was a member of the Connecticut House of Representatives from 1984 to 1986, representing the 104th district (Ansonia and Derby). While a member of the House he sat on the Appropriations and Judiciary Committees.

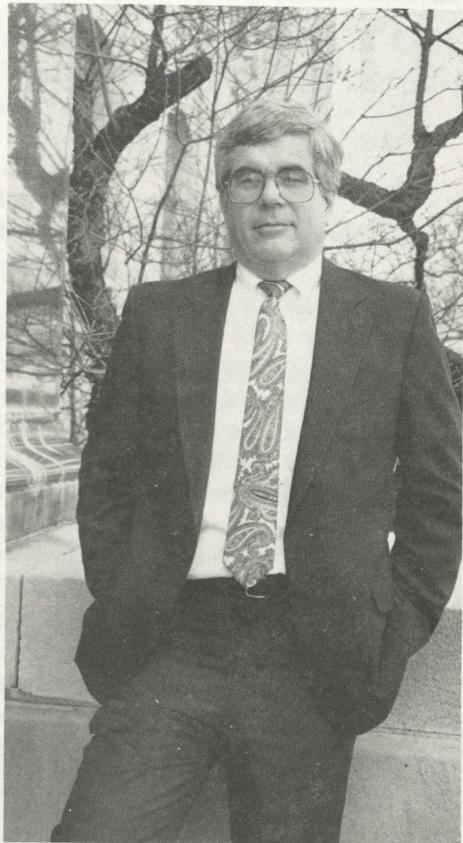
From 1979 to 1988, Dudchik served in Washington, D.C., and in Connecticut as a member of Lowell Weicker's senate staff. During his tenure with Weicker, Dudchik held positions of assistant press secretary, liaison to the General Assembly, and

Director of the Senator's Connecticut field staff. Since 1989 Dudchik has been executive vice president of a New Haven computer software company.

As deputy commissioner, Dudchik said that one of his priorities will be finding alternative funding for programs expected to suffer budget cuts. "Wherever possible, I intend to look to the private sector as well as permit and license fees to reduce the anticipated revenue shortfall," he said.

The branch of Environmental Conservation is responsible for managing the D.E.P.'s Bureau of Fisheries and Wildlife which includes the Law Enforcement Division, the Bureau of Parks and Forests which includes the Boating Safety Division, and the Bureau of Operations Management and Services. □

New Deputy Commissioners



Robert E. Moore, of Durham, has been appointed by Governor Lowell P. Weicker to the post of Deputy Commissioner for the D.E.P.'s Branch of Environmental Quality.

Since 1982 Moore has served as D.E.P.'s Assistant Deputy Commissioner, one of the first three Senior Executive Services positions established in state government. Reporting to the Commissioner, he has been responsible for developing or initiating environmental quality programs including: "Environment/2000," the state's environmental goals and strategies; the Connecticut Clean Water revolving loan program; the "State Superfund" hazardous waste site discovery and cleanup program; the state's ground water management program; the solid waste management plan; the implementation of the recycling program; and Connecticut's Long Island Sound strategy.

Moore joined the Water Resources Commission, D.E.P.'s predecessor agency, in 1967 as a sanitary engineer.

He served in various positions in the water pollution control program and was appointed Director of the Water Compliance Unit in 1979.

Moore earned his B.S.E. in civil engineering and an M.S. in sanitary engineering from the University of Connecticut. He received his State of Connecticut professional engineer license in 1972. He has served on the adjunct faculty of the University of New Haven's Engineering Department.

Moore's priorities include: development and implementation of a comprehensive management strategy for Long Island Sound; implementation of the Clean Air Act Amendments and adoption of the State Air Quality Implementation Plans; full implementation of aquifer protection, recycling, and source reduction programs; and improved management of permit and enforcement programs.

The Branch of Environmental Quality comprises air, waste, and water management bureaus. □

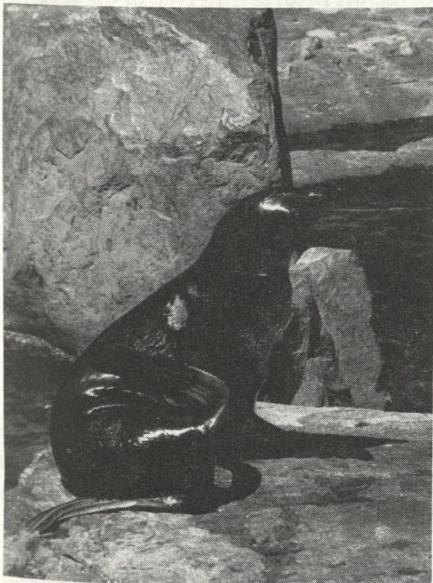
The Bulletin Board

Fun for the Kids

LOOKING FOR A WAY to prevent the kids' "Summertime Blues"? Right here in Connecticut they can confront robotic dinosaurs, rocket into space, explore the animal kingdom, and more. Here, from the Department of Economic Development, is a sampling of state's attractions for children:

Answer the call of the sea at **Mystic Seaport**, an authentic re-creation of a 19th century seaport. The Seaport has an extensive collection of vintage clipper ships, whalers, and coastal schooners that help teach children and adults about the maritime traditions of New England. Craftsmen demonstrate trades like sailmaking, scrimshaw, and ship carving. The pride of Mystic, the *Charles W. Morgan*, last of the wooden whaling ships, celebrates its 150th anniversary this year, and the Seaport pulls out all the stops with a special museum exhibit, daily theater productions on the docks in front of the ship (June 24th to August 30th), and after-hours tours of the vessel by lantern light led by guides in period costume (June 27th to August 30th).

Mystic also is home to the **Mystic Marinelife Aquarium**, with over 6,000 specimens, hourly shows featuring dolphins, sea lions, and whales, and some brand new arrivals -- two baby



penguin chicks, the first to be hatched at the Aquarium.

The world's best-known circus impresario, P.T. Barnum, is celebrated at Bridgeport's **Barnum Museum**. Created along the lines of his own American Museum in the 19th century, the Barnum offers both the astounding and the educational. It includes a history of "The Prince of Humbug" and his relationship with his chosen city of Bridgeport, original Barnum artifacts like the famous Egyptian mummy and a scale model of "The Greatest Show on Earth" composed of more than 3,000 hand-carved miniature figures. For information on hours, call 331-1104.

The **Lutz Children's Museum** in Manchester has one of the largest playscape areas in the state and fascinating interactive indoor exhibits. At an upcoming show, "Tabletop Science Exhibits," kids can explore the colorful world of prisms and stand inside a kaleidoscope to see how it really works. The museum also features 22 different live animals, many of them native to the state, and daily afternoon programs teach children about these creatures. The museum is open every day except Monday. For information and hours, call 643-0949.

Norwalk's **Maritime Center** offers lots for kids to marvel at including its eight-story IMAX theater and the new "Dinosaurs Alive!" exhibit, which features robotic dinosaurs that entertain and educate both young and old. A companion exhibit, "Prehistoric Life," on display through Labor Day, features actual dinosaur fossils dating back 100 million years. For information on other exhibits at The Maritime Center, call 852-0700.

The **Discovery Museum** in Bridgeport launches the first Challenger Learning Center in the Northeast starting in May. Youngsters will be able to experience what it's like to be on a space shuttle mission, with actual experiments in simulators of a mission control station. For information, call 372-3521.

The Waterbury Convention and Visitors Commission offers visits to several fascinating **classic carousels** and a trip to a workshop where more are being restored. Call them at 597-9527 for information.

Families can sample **farm life** in northeastern Connecticut with a "Farming in the Quiet Corner" weekend package July 13th and 14th. The package includes hayrides, farm-related museums, and overnight accommodations. Call 928-1228 for prices and further information.

And for a comprehensive listing of attractions for kids of all ages, as well as accommodations around the state, call the Department of Economic Development at 1-800-CT-BOUND. □

L.I.S.T. WHALE WATCH

Long Island Sound Taskforce (LIST) is holding a Whale Watch Weekend on June 7-9th. Includes two nights at the Provincetown Inn, two breakfasts, one dinner, two whale watch trips. Cost: \$165/person, double occupancy, LIST members; \$190/person, double occupancy, non-members (including one year LIST membership). LIST, 185 Magee Avenue, Stamford, CT 06902. Call 327-9786 for more information.

BIRD WALKS

Litchfield Hills Audubon Society will sponsor bird walks on Sunday mornings, at 7:30 a.m., May 19th, 26th, June 2nd. Meet at the White Memorial Conservation Center parking lot in Litchfield. Bring binoculars and bird books.

NATURE WALKS

White Memorial Conservation Center, in Litchfield, will have nature walks Saturdays, June 1st (beaver), 8th (the natural world), 15th (wild flowers), and 22nd (the Five Ponds area), at 2 p.m. Meet at the museum entrance. □

Trailside Botanizer

by Gale W. Carter
Illustrations by Caryn Furbush

THE PEA FAMILY is one of the largest of the plant families. The aster family (*Compositae*) is the only family with a greater variety of species and the grass family (*graminae*) is the only family that exceeds it in value.

The pea family includes species important for food (peas and beans), forage (clover and alfalfa), and for dyes (indigo). Others are desirable ornamentals such as the golden rain tree and the vine wisteria, and there are many wild herbs like hog peanut, ground nut, and vetch.

Because of the size of the family, it is often subdivided into three groups (sub families). They are as follows:

* *Mimosa* subfamily: Largely trees and shrubs, only rarely herbs. The flowers are regular (radially symmetrical) and in small compact heads with numerous colorful stamens; e.g., mesquite and acacia (mimosa).

* *Cassia* subfamily: Consists mainly of trees and shrubs. The flowers are irregular (bilaterally symmetrical), but less pronounced than the *Papilionoideae*, and often large and showy; e.g. redbud, honey locust, Kentucky coffee tree.

* *Papilionoideae* subfamily: Made up of herbs, trees and shrubs. The flowers are butterfly-like and typically irregular. The largest and most advanced of the three subfamilies; e.g., clover, black locust, lupine.

GENERAL CHARACTERISTICS of *Leguminosae* include:

* Flowers arranged in racemes or heads.

* Corolla irregular except in subfamily mimosa; typically with five separate petals. A large showy petal (standard), two side petals (wings), and two lowest petals more or less joined (keel).



Groundnut (*Apio americana*)

The Pea Family

* Ten stamens may have filaments combined into a tube, with one filament remaining separate or with all filaments separate.

* Pistil simple with one chamber for ovules.

* Fruit a pod, splits lengthwise into two halves, or in a limited number of species the pod breaks into sections instead of splitting.

* Majority of species have compound leaves.

* Tendrils to assist in climbing present in some species.

THE SUBFAMILY *papilionoideae* is the one that will be discussed in this article.

BLACK LOCUST (*Robinia pseudoacacia*) has showy flowers and zigzag

stems with paired spines, and its distinctive furrowed bark makes black locust an interesting tree in all seasons.

The leaves are compound, consisting of seven to 19 paired leaflets, except for a single leaflet at the end. These leaflets droop and fold at night. This is sometimes referred to as their night sleep, but there is no real explanation as to why this happens.

The very fragrant flowers are white and pea-like, appearing in spike-like clusters on long drooping stalks from the axils of the leaves.

Its pendant fruit is a dark brown, papery, two to four inch pod, with four to eight spotted seeds. These pods mature in early fall and often remain on the tree all winter.

Black locust is a native of the southern United States but has been

introduced into New England. It has escaped and is presently found growing in fields and along fences and roadsides as well as in moist woodlands.

The generic name honors Jean Robin, herbalist to Henry IV of France and his son Vespasien. At least one of the Robins introduced the black locust into Europe where it later became very popular. The species name means "false acacia." The common name, locust, was given to this species by the colonists at Jamestown in 1607. They gave it this name because they thought it resembled the carob tree, or Old World locust.

The wood of black locust is very hard and durable, having many uses if it were not for the locust borer beetle that damages the wood. Historically, black locust was used for corner posts for early Colonial houses and for making wooden nails that were used for ship-building. Today, it is largely used for railroad ties, fence posts, and fuel. Its value for wildlife is limited, but mourning doves and rabbits sometimes eat the seeds, while white-tailed deer may browse on the foliage.

GROUNDNUT (*Apis americana*) is a plant that may climb and twine to a height of 10 feet. If the stem or flowerstalk are broken, a milky juice will be emitted.

It has smooth, light green leaves that are compound. Each leaf has two or three paired leaflets and a terminal leaflet. The leaflets are egg-shaped and pointed.

Located beneath the ground is an underground stem (rhizome) containing a series of potato-like tubers that are separate from one another yet linked together like beads on a rosary.

The pea-like flowers are brownish-purple and grow out from the leaf axils. They appear in dense clusters (racemes) and give off an odor that has been called one of the strongest and sweetest of the wildflowers.

Each flower is about one-half inch long, with the two lower petals (keel) curved upward like a scythe. The flowering period is from July to September. The fruit is a slender pod up to four inches long. Groundnut

may be found draped over bushes and fences or in moist woods and thickets.

The genus name *Apis* is a Greek word for "pear," describing the shape of the tuber. The common name also refers to the tubers that are called "groundnuts."

Groundnuts played an important role in Early America. They were considered an important food by the Indians and were cultivated in many of their villages. They appear to have had the same role in the diet as the potato long before the potato, a native of the Andes, was introduced into North and Central America by the Spanish.

The Pilgrims of the Massachusetts Bay Colony were able to survive their first winter in America because the Indians of that region introduced them to the uses of groundnut.

The tubers may be steamed, boiled, baked, or fried and were used in casseroles, chowders, and vegetable dishes.

RED CLOVER (*Trifolium pratense*) is a biennial and one of our most common types of clover. It is a large species compared to many other kinds of clover, varying in height from six to 24 inches.

There are usually several plants growing in a clump. Each erect hairy stem generally has two round flower heads.

The leaves are divided into three leaflets and are on long stalks. Each leaflet often has a whitish V-shaped marking on its upper surface.

The cup-like calyx is hairy and shorter than the petals.

The reddish flower head may have from 40 to 60 florets with each floret resembling a miniature sweet pea flower. The stamens and pistil are enclosed in two fused petals. These must be opened to allow pollen to escape. The flowering time is from May to September.

All clovers must depend on bees if they are to be fertilized. Bumble bees, because of their large size and long tongues, are the best pollinators of red clover. Domesticated honey bees are less effective because of their shorter tongues and because they more often seek the small white clover to produce

their honey.

We generally think of red clover as a plant of grassy areas in a rural setting. This is true, but we also find clover quite commonly in waste areas such as vacant lots. It grows well here because it has nitrogen-fixing bacteria on its roots, helping it to enrich the soil. Red clover is an excellent species to use for hay.

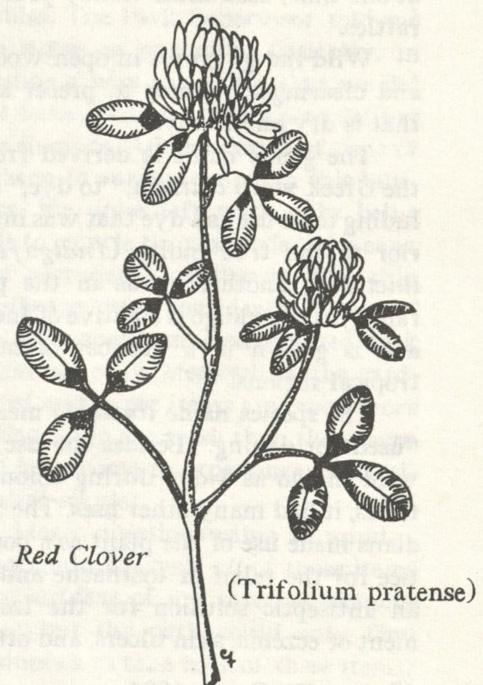
The generic name *Trifolium* describes the three leaflets that make up each leaf. *Pratense* means "of meadow," one of its favorite habitats.

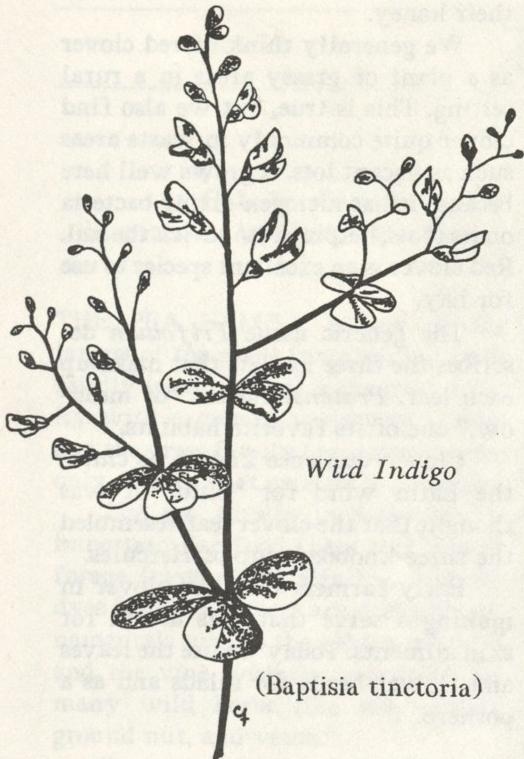
Clover was once known as *clava*, the Latin word for "club." It was thought that the clover leaf resembled the three-knobbed club of Hercules.

Early farmers used red clover in making a salve that was useful for skin ailments. Today we use the leaves and flower heads for salads and as a potherb.

WILD INDIGO (*Baptisia tinctoria*) is an impressive looking plant with its many-branched erect, smooth, blue stem. It is a perennial that grows to a height of two to three feet.

The nearly stalkless leaves are rather small (one-half to one and one-half inches) and numerous, consisting of three round to egg-shaped leaflets. Each leaflet is coated with a white powdery bloom. When the leaves are dry they turn black.





The yellow pea-like flowers develop in numerous clusters (racemes) that appear on the upper branches. Each flower has 10 stamens that are free from each other. The style is curved slightly inward and the stigma is small. Flowers of wild indigo are in bloom from May to September.

The fruit is a round, many seeded, woody pod with remnants of the style remaining as a beak at its tip. Children, at one time, used these woody pods as rattles.

Wild indigo grows in open woods and clearings. It seems to prefer soil that is dry and sandy.

The genus name is derived from the Greek word *batizein*, "to dye," alluding to its use as a dye that was inferior to the true indigo (*Indigofera tinctoria*), another genus in the pea family. True indigo is a native of India and is grown in a number of subtropical regions.

The species name *tinctoria* means "used for dyeing." Besides the use of wild indigo as a dye during colonial times, it had many other uses. The Indians made use of the plant as a poultice for the relief of toothache and as an antiseptic solution for the treatment of eczema, skin ulcers, and other

© Gale W. Carter 1991

wounds. A tea made from the root was employed to induce vomiting and as a cathartic; however, there was danger in using large amounts.

The plant also has flowers that are attractive enough to be used in the wildflower garden.

COW VETCH OR CANADA PEA (*Vicia cracca*) belongs to one of the genera in the pea family that is a climber using other plants for support. Growing out of the tips of the leaves are thread-like tendrils that may coil around nearby plants and smother them.

The stem is from two to five feet long and is often covered with small hairs.

Its compound leaves are grayish green and are divided into eight to 12 pairs of narrow, bristle-tipped leaflets. At the base of the leafstalk of each leaf are two small appendages (stipules) that are leaf-like.

The flowers are pea-like and vary from blue-violet to purple. One form is white. They are numerous and appear in one-sided racemes that grow from the axils of the leaf. Each flower is one-half inch long. The style of the flower has a tuft of hairs at its tip. This is unique to the genus *Vicia*.

Blossoming time is from May to August.

The fruit is a thin lance-shaped pod, three-quarters of an inch to an inch long. It has a smooth surface and contains five to eight seeds.

Cow vetch is found in fields, roadsides and along the border of thickets.

The genus name *Vicia* is a Latin word meaning "twining plant." The meaning of the species name is obscure.

Its common name refers to any of a number of climbing or twining plants in the genus *Vicia*.

Cow vetch is valued for forage and hay. It has nitrogen-fixing bacteria on its roots that help to rejuvenate the soil. This plant is also used to cover and protect banks along parkways.

Wild peas or vetchling (*Lathyrus*) is a similar genus but differs from *Vicia* in a number of ways. Its flowers have a style that is hairy along the side instead of at the top; the flowers of wild peas are generally larger; the leaf is composed of fewer leaflets and they

are larger; and the stipules at the base of the leafstalk are larger.

CANADA TICK-TREFOIL (*Desmodium canadense*): in the Northeast there are 20 or more species of tick-trefoil. Most of these have flowers that look much alike. For this reason careful observation of the leaves and seed pods is necessary for accurate identification.

One of the easiest species to identify is the Canada tick-trefoil because of its large showy flowers that appear in dense terminal clusters (racemes). It is a many-branched, hairy plant that grows from two to six feet in height.

The leaves are compound, with three untoothed clover-like leaflets. There are leafy, lance-shaped stipules at the base of the leafstalk.

The flowers are rose-purple at first, later turning blue. Each flower is up to three-quarters of an inch long. It has 10 stamens, nine of which are joined. The flower appears from July to August.

The fruit is a pod that is three- to five-jointed and one inch long. Its surface is covered with hairs with small hooks that enable it to cling to clothing or the fur of animals when the pods split up into sections. This is unlike most other members of the pea family that have pods that split along the sides. These small sections are sometimes called "beggars' ticks." Thoreau commented about these ticks, "Though you are running for your life, they would have time to catch and cling to your clothes."

Look for Canada tick-trefoil in dry, open woods and along the edge of fields.

The genus name *Desmodium* is Greek for "a chain," a reference to the connected joints of the fruit. The species name indicates the place where the species was first described. The common name trefoil describes the three leaflets of the compound leaf.

The early settlers found tick-trefoils useful as fodder for their cattle and horses, while the Cherokee Indians chewed the root of at least one species to relieve inflammation associated with ailments of the mouth and gums, and a tea made from the root was used for relief of cramps. □

Letters to the Editor

OUR RECENT ARTICLE in *Connecticut Environment* was very interesting to me especially the graph of the electro-magnetic spectrum. I have seen graphs like this before so it was not strange to me.

However recently I have been hearing of the MRI (magnetic resonance imaging) units that are being used in some of our hospitals. How and where does this fit into the picture? Like X-rays they are invisible but also like X-rays there are available photographic emulsions which are sensitive to them. Essentially what wave length(s) were used in the magnetic field of the MRI?

Incidentally, an MRI test was recently conducted on me and it was very confusing and mysterious. The two technicians who did the testing seemed to be just as confused as to what they were doing as I was. They merely pushed a few buttons, etc., and did not seem to understand what was being done.

Very truly yours
Norman Wickstrand
Farmington

THE MRI IS BECOMING MORE widely used for two reasons. One is the elimination of exposure of the patient to ionizing radiation, and the other, more importantly, is the better quality organ images that are produced. The technology is very complex, but I will try to explain how it works.

The patient is put into the MRI and the machine is switched on and off two or three times. The production of the intense static magnetic field and collapse of the field cause the positive charged atoms of the body to produce a high frequency radio wave. Since the body is transparent to radio waves, the intensity varies according to the atoms that produce them. When they are received by the antenna of the machine and processed through a computer, an image is produced based on the variations of the intensity.

The computer then converts the images to visible light energy that ex-

poses standard photographic film. It is NOT the magnetic field itself that produced the picture on the film, but the visible light produced by the computer that exposes the film. The images produced in this way are more detailed than are possible with X-rays; hence the doctor is able to see the organs in question much better, and the patient has been spared the exposure to ionizing radiation and exposed only to non-ionizing magnetic fields and radio waves.

Due to the complexity of this process, it is not surprising that the technicians who operated the machine used on you did not take the time to tell you much about what was going on. I would suggest that when you have questions about a procedure like the MRI, X-ray, or CT scan you ask to speak to the department's radiation physicist. He or she will be able to take the time to answer your questions. He can explain the procedure and provide more information on the technical aspects of the process.

Shepard K. Linscott
DEP Radiation Control Physicist

To: Francine Jackson
c/o *Connecticut Environment*

THERE MAY BE SOME CONFUSION about calendar dates mentioned in your "Night Sky" column in the January 1991 issue of *Environment*.

Enclosed is a letter I wrote last year to *Smithsonian* on this subject that presents my point of view.

I do not agree ... that the 21st century begins just after midnight of December 31, 2000 (January 1, 2001).

According to Webster, A.D., Anno Domini, means time falling within the Christian era. Since A.D. signifies dates after the birth of Christ, we begin to measure A.D. time at the instant of His birth ("It came upon a midnight clear"). Then, after the passing of one year, we count "1," after the passing of 10 years we count

"10," after 100 years we count "100," after 1000 years we count "1000," and at the instant when December 31, 1999, changes at midnight to January 1, 2000, we count "2000." Therefore, this exact instant of time will be the end of the 20th century and the beginning of the 21st century.

All we need remember is that in counting years we start at zero just as we do when measuring shorter intervals of time with a stopwatch.

Benjamin F. Tyson
Stamford

IN YOUR JANUARY ISSUE you requested the thoughts and ideas of your readers for potential articles. I would like to read about how small business and others are handling (or not handling) the switch over to mandatory recycling.

I work at Wickham Park in Manchester. We are a small organization, and we haul our own trash to the "dump" weekly. At the beginning of January we had to devise a new plan for recycling some of the accumulated trash in our one main building.

I began to make phone calls to many businesses that accepted recyclables. The Park Supervisor told me we were on our own, basically, in finding a way to recycle, that we did not have a transfer station to deliver our items to. After a period of time of talking to various people in this business, we were left with only being able to recycle tin cans, soda/juice cans, and corrugated cardboard. The thin cardboard was considered "useless," and the paper businesses wanted bulk deliveries only. Meanwhile, the cardboard and paper items are much more abundant in the trash than the others, as I have come to experience as a residential recycler.

Many questions came to mind ... why could I recycle all of those items as a resident of my town of Manchester, but the park could only find businesses to take half of these items? Where was there a transfer station

where we, as a non-big-business, non-residential trash accumulator and eventual recycler, could go? How many businesses are skirting this new law because of the many problems encountered in trying to just develop a recycling program on their own? And why aren't there any phone numbers that people can call to get advice on how to go about recycling?

There must be others out there who need help in adhering to this new law, who want to recycle but are falling short in their performance of carrying out this recycling effort.

I would appreciate an article on this subject or just a personal response, on your part, with respect to this recycling problem.

Thank you for your time and enclosed is my donation for 11 more issues.

Sincerely,
Molly Schmitz
Manchester

The questions about recycling in a small business are really questions on markets. The problems encountered by the small business owner are a reflection of the need for small businesses and similar organizations to work cooperatively with other small organizations when setting up recycling programs. For example, if a given business does not generate enough white paper or corrugated cardboard to interest a paper market in providing service, they might consolidate with other nearby small businesses for pick-up. A dumpster may be shared to collect white paper, corrugated cardboard, or any other material and allow for a sufficient quantity to make it worth the paper processor's time to come out and make a pick-up. Recycling runs on economics. If a processor can get a large quantity of high quality material, the material will move.

Other possibilities include shredding the white office paper generated by a small business and using it to package products when they are shipped. The goal is to remove the nine required items from the waste stream.

Some towns in Connecticut provide a white paper dumpster at the

local residential drop-off center and allow small businesses to use it. If this service is not offered, small business owners could work to have them made available in their communities by speaking to local officials.

As far as getting assistance with recycling, start by contacting your current trash hauler, then your town hall, and finally look under recyclers in your local telephone directory. The D.E.P. held a series of workshops for businesses last fall in association with the Connecticut Business and Industry Association, Southwest Area Commerce and Industry Association, and local chambers of commerce. A set of business recycling fact sheets are available from a dozen Sir Speedy Printers around the state. These include a host of ideas for setting up recycling programs in a business as well as market lists.

The law is written in such a fashion that residential recyclables have to be accounted for by the town, whereas the business community is required to "provide for separation." This accounts for your ability to recycle more at home. Recycling in small businesses right now does require more creativity than is needed in a larger organization or at home.

Kim Trella
D.E.P. Recycling

THANK YOU FOR YOUR ARTICLE, "Herd or Horde," in the February 1991 issue. It saddens me to think of D.E.P. personnel subjected to doubts and ridicule about their professional methods or reasons for authorizing a deer hunt at Bluff Point.

It upsets me as a taxpayer that valuable funds meant for managing the state's ecosystem must be spent on time-consuming court challenges. And it angers me that politicians cannot look at the facts and make a sensible decision. Proposals for a one-year delay, "... to further review the situation," are meaningful only to the deer; the ones dead of starvation.

I would like to suggest that before supporting any environmental organizations, separate the "doers" from the obstructionists. This can easily be ac-

complished by looking at a group's federal tax return, which is a matter of public record, or ask the organization to send you a copy.

If more monies are being spent on salaries, travel, advertising, and public relations, then ecological concerns are NOT the group's primary purpose.

Robert A. Suprenant
Colebrook

WE RECEIVED TWO LETTERS supporting DEP's position on the Bluff Point hunt. Quite a few other writers indicated their opposition in letters to Governor Lowell P. Weicker and Commissioner Timothy R.E. Keeney. Ed.

I AM WRITING IN REGARD to an article in *Connecticut Environment*, June 1990. Robert Altamura's "Historic Geologic Sites of Connecticut" describes "The Great Unconformity" in Southington, Connecticut.

I would like to obtain detailed directions to a location where I may observe and photograph this Unconformity. Any help you might provide would be appreciated.

Edward A. Biatowas
Guilford

P.S. My family has enjoyed the publication since it was the *DEP Citizens Bulletin* about 17 years ago.

"THE GREAT UNCONFORMITY" is located on private land not open to the general public, according to DEP Natural Resource Center geologist Sid Quarrier. As with other natural features of interest in the state, persons involved in activities such as educational research, writing articles, or conducting educational programs may be able to visit these sites by making special arrangements through the DEP Natural Resources Center.

I THINK you're putting out a worthwhile publication.

John R. Snow
Waterford

The Night Sky

Country vs. City Skies

by Francine Jackson

IN THESE ARTICLES, I often refer to the difference between the city and rural skies. Any of you who access to one and visit the other will immediately see the incredible change from one to the other. City residents who have been able to identify and memorize constellations from their backyards will literally get lost amidst the thousands of extra stars that magically appear overhead. The one or two hundred stars are suddenly multiplied 10 or 20 fold, showing a richness of sky never imagined under the false daylight of a nighttime city sky.

Most of you probably have heard the term for this lightness: skyglow, brought on by light pollution, caused by misdirected or excessive outdoor lighting. Outdoor lighting has enabled cities to be as productive at night as during the day. It is also usually considered a crime deterrent — someone is less likely to approach you if you are able to get a good look at him. But, the

CORRECTION REGULATIONS TO GO

IN THE NOVEMBER ISSUE we published the wrong phone number for the Commission on Official Legal Publications in Enfield, which publishes the Regulations of Connecticut State Agencies. Their correct number is 741-3027. Our apologies to readers who found themselves being asked for their pizza orders

I THINK YOU ARE doing a great job. I find everything very interesting and am learning a great deal about our beautiful state.

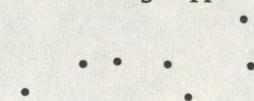
Thank you.

Robert Dickerson
Higganum

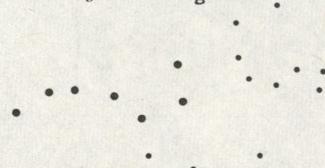
questions coming up these days concern where lighting should be placed, how much should be used, can there be too much light, are there different types, and are all types interchangeable.

Of course, for people such as myself, the question is how can I keep the night sky from deteriorating any more than it has. To any optical astronomer, lighting puts a damper on his livelihood. For instance, many of you may be aware that one of the largest U.S. telescopes, the 100-inch reflector in

City view Big Dipper



Country view Big Bear



Looking southward,
almost directly overhead.

California, is no longer being funded, primarily because of the loss of sky conditions brought about by urban sprawl.

While no astronomer (professional or serious amateur) can object to the use of night lighting, to preserve the nighttime stars for future generations serious consideration must be given to how the Earth is to be lighted, how more of the light can be directed downward (where it belongs), and how bright a lamp is really needed to do the job adequately.

In the meantime, if you are able to trek to a dark sky, here's a little test of how the sky differs from city to country. In your back yard, face south, then crane your neck until you see the Big Dipper, just as you did last month as a help in finding Leo, the Lion.

Now, go out to the country and do the same; this time, however, you should see the whole constellation that the Big Dipper is only a small part of: Ursa Major, the Big Bear. Notice how easy the pattern is to see — you now know why so many civilizations recognized the Bear in this part of the sky. Their views included no light pollution of any kind. □

Endnote

SINCE THE BEGINNING, I have enjoyed reading *Connecticut Environment* magazine. The articles are informative, enlightening and entertaining. Please keep up the good work and continue to keep the public aware of important issues which threaten our air, land, and waterways, and wildlife.

Michael J. DiCioccio
Wethersfield

WE HAVE ENJOYED COPIES of *Connecticut Environment*. The articles are generally well-written and on an interesting variety of subjects. I hope the present state budget problems will not affect publication in the future.

Edwin S. Smith
Pomfret Center

"THE HISTORY OF LIFE on earth has been a history of interaction between living things and their surroundings. To a large extent, the physical form and the habits of the earth's vegetation and its animal life have been molded by the environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its surroundings, has been relatively slight. Only within the moment of time represented by the present century has one species — man — acquired significant power to alter the nature of his world."

Rachel Carson



Connecticut Environment Sailing Into The Sunset

CONNECTICUT
ENVIRONMENT

Department of Environmental Protection
State Office Building, Rm. 112
Hartford, CT 06106

SECOND CLASS POSTAGE PAID
AT HARTFORD, CONNECTICUT

For the last few years we have usually filled this space with an invitation to you to subscribe or give a gift subscription. This month we must withdraw that offer.

After 18 years of efforts to inform readers about Connecticut's natural resources and outdoor recreation and to keep the state's citizens up to date on environmental issues as well as on what's going on at the Department of Environmental Protection, *Connecticut Environment* will cease publication.

This magazine is one of the programs that will be cut as part of the efforts to balance the state's budget. While subscriptions have paid for printing and distributing the magazine, they have not covered staffing, and under the proposed budget our staff positions are eliminated.

Although we still hope that alternate funding may be identified to let us resume publication in the next fiscal year, at present we plan to suspend publication after the June 1991 issue. □